

Naval Postgraduate School Graduate School of Business & Public Policy Requirements for Remote VTE Classrooms

Purpose

This document describes the minimal remote VTE classroom standards required for effective instruction. GSBPP believes that instructional technologies must serve learning; consequently, these standards, based on seven years of VTE experience, reflect the technological capabilities that remote VTE sites require to support instructional and learner effectiveness. Neither GSBPP or program sponsors want to compromise learning due to an inadequate VTE facility.

Consulting Help

GSBPP and NPS provide consulting help to insure that commands have or can develop the capabilities needed to support learning via VTE. Tracy Hammond thammond@nps.navy.mil is the POC for this help.

General Standards

GSBPP VTE programs are delivered via ISDN based dial-up videoconferencing systems. GSBPP must certify through testing that a remote site facility has the necessary capabilities to provide effective VTE instruction. GSBPP will provide sites with specific guidance to help them meet the baseline requirements described in this document.

However, GSBPP may disqualify a remote VTE facility based on testing results or other deficiencies that become apparent during testing that would, in the judgement of GSBPP faculty, impair the quality of student learning. Listed below are the broad-based criteria that GSBPP will use when testing remote sites:

- Connection stability
- Video quality
- Audio quality
- Compatibility with NPS equipment
- Inadequate technical support and/or operator training

Remote sites are required to have:

1. An H.320 compliant videoconferencing system with direct connection to the PSTN

(Public Switched Telephone Network) via ISDN service. Facilities that must connect via gateways or hubs are not supported and will not be accepted for participation.

2. Minimum bandwidth capability of 384 kbps.

Personnel Requirements:

Remote sites are required to have experienced technical support readily available to ensure that technical problems causing instruction to be interrupted are addressed immediately. In addition, two persons shall be trained as operators of the classroom equipment (one as primary operator, one as alternate). One of these operators, who could be a student, must be present in the classroom at all times when class is in session.

Facility Requirements

We recognize that videoconferencing technology varies in design and performance. Furthermore, equipment configuration may vary depending on brand and design. Consequently, it is impossible to define a specific equipment list and an ideal configuration without being unduly exclusive. As a result, latitude is allowed in equipment choice. However, a site's equipment and its configuration must support the interaction required for both faculty and students to have a high quality learning experience.

Physical Space

The classroom must be a fully enclosed, well lighted, carpeted space free of noisy equipment, and of sufficient size to provide comfortable seating for all participants. The shape of the classroom and the seating arrangement must allow for all participants to be seated within the camera's field of view without requiring pan/tilt operation for the faculty to see all the students.

HVAC must be sufficient to allow comfortable use of the room during the warm season with windows closed.

Acoustics

The classroom must have appropriate acoustic treatment to control audio reflections and reduce ambient room noise. If the classroom is located near machinery rooms or other sources of noise, sufficient noise isolation is required to prevent external noise from interfering with audio communications between sites.

Lighting

Good video quality for VTE requires more light than typical office spaces. Overhead fluorescent lighting is a good choice, provided there are a sufficient number of fixtures. In general, the lighting must be sufficient in quantity and positioning to illuminate participant's faces without casting heavy shadows.

Equipment

- 1) **Group Videoconferencing System**. One H.320 compliant videoconferencing system designed for group applications.
 - a) Desktop videophones or desktop PC based systems are not acceptable.
- 2) **Audio System**. The audio system must be of appropriate design for the classroom with regard to room area and volume, number and location of students, and acoustic characteristics of the room. The following equipment must be provided:
 - a) **Echo Canceller**. The echo canceller may be provided internally by the VTC codec or an external device. The echo canceller must be capable of controlling echo during an interactive discussion between participants at all sites when the classroom is fully populated with students and the incoming audio is amplified sufficiently to be easily heard by all students in the classroom.
 - b) **Microphones**. The microphone system must be designed and installed to maximize signal to noise ratio by rejecting ambient and other unwanted noises.
 - i) A suitable number of microphones properly positioned with regard to their pickup pattern and the number of students.
 - ii) For directional tabletop mics, the rule of thumb is one microphone for every two students.
 - iii) Non-directional tabletop microphones, if used, shall be positioned so that no student is positioned farther than 6 ft from the microphone, or the maximum distance recommended by the audio system manufacturer, or the maximum distance judged to be effective during qualification testing, whichever is less.
 - iv) Microphones should not be positioned near hard vertical surfaces, unless that surface is an intentional acoustic boundary intended to enhance microphone performance.
 - c) **Sound System**.
 - i) General. The sound system must be designed to provide adequate and intelligible amplification of the incoming audio signal, based on the number of students, the size of the classroom, and its acoustic characteristics.
 - ii) Loudspeakers must be positioned at sufficient distance from microphones to prevent tasking the echo canceller beyond its capabilities.

- iii) A volume control must be readily available to the designated classroom operator. Appropriate volume level will be established through testing early in the program. The proper level shall be recorded by the operator, then checked and adjusted prior to the beginning of each class session.

- 3) **Video Displays.** The video displays must be of sufficient size and resolution to ensure that remote students can easily see images sent from the instructor's site are readable by all students in the classroom.
 - a) One video display must be provided for incoming video signals (far-end display).
 - b) One video display must be provided for locally generated video signals (near-end display).
 - c) The size and number of video displays shall be such that the distance between any single student and the video image is not greater than eight times the height of the video image for both the near-end and far-end displays.
- 4) **Document Camera.** One document camera shall be provided and ready for use at all times when class is in session.
- 5) **Videocassette Player.** One VHS videocassette player will be provided, connected to the videoconferencing system, and ready for use at all times when class is in session. The system will be configured to allow the audio and video signals of videotapes to be viewed and heard at both local and remote sites.
- 6) **Computer.** A desktop or laptop computer meeting the following requirements:
 - a) 500 Mhz Pentium II or better.
 - b) Windows 98, NT, or 2000.
 - c) Microsoft Office 98 or 2000 (including PowerPoint)
 - c) Broadband internet connection with Microsoft Internet Explorer 5.5 or higher, and Netscape 6 or higher.
 - d) Current versions of Macromedia Flash, Apple Quicktime, RealPlayer, Windows Media Player plug-ins installed.

Provisions for Visiting Faculty

GSBPP faculty teaching a VTE class are required to teach at least one class on site at the remote classroom. On these occasions instruction to all participating sites, including NPS, will originate from that remote classroom. Each participating site must make the following provisions for faculty visits:

- 1) Seating. A seating position shall be provided for the visiting faculty member such that the distance between the faculty member and the near and far-end video displays is not greater than six times the height of the video image. For the classroom computer monitor, that distance shall not be greater than three times the height of the computer monitor's video image.
- 2) Visual Aids. The document camera, VHS player, and computer must be positioned for use from the faculty seating location. Sufficient space must be provided for use of these devices without the need to move one device before using another. Sufficient tabletop or desktop space must be provided for the faculty member to position course materials for easy access while teaching.